NCPA Downlink

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Using The Packet Node Network

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Using the packet node network can make your operating time on packet more enjoyable and it can greatly expand the area that you can reach. The network of NET/ROM, TheNet, G8BPQ and KAM nodes is expanding very quickly and now covers most of the country. Thanks to all of these stations and the interconnecting links, you can now connect to stations in many far distant places using a low powered 2 meter rig. Some nodes are set up for cross-banding, and with the introduction of nodes on 10 meter FM, there's the possibility of working a station just about anywhere.

A packet node, in most cases, is still set up for digipeater operation, but for most of your connections you'll want to use the node features. When using a string of digipeaters, your packets have to reach their destination parity correct, and the receiving TNC has to return an acknowledgement (ack) to your TNC for each packet cycle to be completed. As you add more digipeaters to the string, the chances of this happening become less and less. Other stations on the frequency as well as noise can be the cause of many retries. When using a node, however, your packets no longer have to reach their destination before acknowledgements are returned to your TNC. Each node acknowledges your packet as its sent along the way toward its destination.

If you've been monitoring lately, you might have seen the nodes in action. You might have wondered why they were sending all of those weird symbols like @fx/<~ What you're seeing is the nodes communicating with each other and updating their node lists. You also might have noted callsigns with high numbered SSIDs, such as WB9LOZ-14, WA6DDM-15, W6PW-12, etc. The nodes change the SSID of all stations so that the packets sent via the network are not the same as those sent directly. If you were to use a node to connect to another station in the local area, there's the possibility of your packets being received by this station both from you directly and from the node. If the call through the node wasn't changed, the TNCs involved would be totally confused as it would appear that two stations were connecting using the same callsign. The node automatically changes the SSID using the formula 15-N, where N is your usual SSID. A call with -0 becomes -15, a -1 becomes -14, -2 becomes -13, etc.

NCPA General Meeting is May 8th in Sunnyvale. See page 19 for details. Be there!

The node network is very simple to use. You first connect to a local node. It should be one where you can connect direct with good signal strength. Once you've connected, you then have several options—connect to another station within range of the node, connect to another node, connect to an associated BBS, obtain a list of the nodes that are available, or check route quality and user status. On NET/ROM and TheNet nodes you can also call and answer CQ.

There are several commands available on your local node. All have CONNECT, NODES, ROUTES and USERS, and depending on the type of node you're using, you might also find the BBS, BYE, CQ, INFO, MHEARD, PARMS or PORTS commands available.

The Packet Node Commands

CONNECT

The CONNECT command (which can be abbreviated as C) is used just like you use the CONNECT command with your TNC. To connect to another local station using a node, first connect to the node and then enter C followed by the callsign of the station you want to reach.

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In This Issue

Editorial

Mike Chepponis, K3MC
Downlink Editor

Hello once again! It's a pleasure to bring you another outstanding issue of the NCPA Downlink. We've been working on this one for some time (and some would say we've been working on it **too** long! That's why we've skipped an issue, the Winter '92 issue, and gone straight for Spring '93. Don't worry, we're not skipping any number of issues that you get when you join NCPA (Yearly it's still $10 - what a deal! And you get 4 issues of The Downlink, too!).

So, to this Spring issue. Larry Kenney, WB9LOZ, does his usual excellent job explaining how to really use the NET/ROM, The Net, G8BPQ, and KAM nodes. Some would argue that such information shouldn't be in a publication like ours, that it's too tutorial. I say Bunk! NCPA exists to do Education and Frequency Coordination. We will run a balance between beginner's info, news, and advanced packet material. Write and tell us how we're doing! We always appreciate feedback, and our packet addresses are listed in the column to the right.

Dennis Matzen, KA6FUB, tells of his trials & tribulations getting 9600 baud going on the backbone. If you are interested in the BBS Backbone, or are interested in 9600 baud, head straight to KA6FUB's article for some insight on what it takes to be successful at 9600.

Fred Lloyd, AA7BQ, has a great article on hamfests and swap meets. See if you don't see yourself in his descriptions, on either side of the table!

Our own WD6CMU pens a few lines explaining Directed Forwarding for the PBBS LANs. You can see that there has been quite a bit of thought given to how forwarding works in Northern California...and probably explains why people almost never complain about it - it works too well!

We've reprinted the ARRL Proposed HF Rule Changes, because we think what's happening on HF is important to us all. Even with "worm hole" connectivity through wired networks, HF continues to play an important part of the forwarding network.

Next time, we'll have N6QMY back and doing his usual excellent job of Book Reviewing a book of current interest to hams & digitial communications.

Plus, we'll have details on a Japanese system that runs FSK at 64 kbits/sec on the 1.2 GHz band. And, as usual, a whole lot more original stuff.

Until next time, see you on the other end of an email message!

-Mike K3MC

p.s. To users of the K3MC BBS: Sorry, it's QRT for users on 2m. The NCXPN revoked the grandfathering that had been granted for some stations to forward on 2 meters. It's now only on a backbone forwarding frequency for BBS connectivity, and now serves exclusively as a gateway between TCP/IP and the BBS network.

The NCPA *Downlink*

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ARRL Proposes New Rules for HF Packet

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of

Revision of Part 97 of the Rules
Governing the Amateur Radio
Services Concerning High-Frequency
Data Communications

To: The Commission

PETITION FOR RULE MAKING

The American Radio Relay League, Incorporated (the League), the national non-profit association of amateur radio operators in the United States, by counsel and pursuant to Section 1.401 of the Commission's Rules, hereby respectfully requests that the Commission issue a Notice of Proposed Rule Making at an early date, looking toward changes in Part 97 of the Commission's Rules governing the Amateur Radio Services (47 C.F.R. Section 97.1 et seq.) in accordance with the attached Appendix, so as to permit automatic control of RTTY and data communications in certain specified portions of the high-frequency (HF) amateur bands, under certain conditions. The League's goal in submitting this petition is to encourage experimentation, development and refinement of these efficient communications modes; to adapt complex digital technologies to practical use; and to permit the implementation in the Amateur Radio Services of more efficient emergency and public service communications technologies for rapid information transfer. As good cause for its petition, the League states as follows:

I. Introduction

1. A recent Notice of Inquiry issued by the National Telecommunications and Information Administration (NTIA) stated that currently, the Amateur Service performs an important and useful function as an adaptor of complicated and expensive technologies, often producing versions of communications systems more suitable for practical use. This is an apt description of the abilities of the Amateur Radio Services in the area of new, especially digital, communications. Improvements in digital communications modes and protocols, and adaptations of data modes and protocols, are proceeding at a rapid pace. The Commission has been a partner with the Amateur Radio Service in this process, by creating or revising rules to permit the development or implementation of such technology, and by granting experimental licenses or issuing special temporary authorizations where necessary in specific cases. The results of these efforts have often flowed to licensees in other radio services, which have used amateur-developed equipment and communications protocols commercially.

2. Digital communications in the high-frequency (HF) amateur bands are enjoying a period of especially rapid development. While current rules allow considerable latitude in terms of what digital modes are permitted in amateur bands, certain modes are more firmly entrenched in operating patterns than others. Current data operation in the HF bands includes RTTY, a non-error protected simplex mode, usually using the Baudot code; AMTOR, a partially error-protected mode using the ASCII code; and packet radio (packet), an error-protected mode using the ASCII code. In addition, the Amateur community is presently experimenting with a new DSP-based system called CLOVER which is an error-protected, highly spectrum efficient mode, and with PACTOR, an error-protected mode.

3. Digital techniques for HF operation are improving, and newer technologies such as PACTOR and CLOVER promise significant near-term improvements under difficult ionospheric conditions in the HF bands. While the rules contemplate the use of these modes in the HF bands, they do not accommodate a full exploration of the capabilities and utilities, such as automatic networking, offered by them, due to the requirement of local or remote control for amateur stations operating below 50 MHz. This is one of those infrequent instances where, in order to allow the Amateur Radio Service the technological flexibility it requires to develop and adapt new technologies to practical use, the rules require some fine tuning.

II. Background: The STA

4. The Amateur Radio Service Rules currently permit automatic control of digital communications, but only above 50 MHz. Third party communications cannot be transmitted under automatic control except for packet stations above 50 MHz while using the AX.25 packet protocol. Automatic control of data communications was first authorized by the Report and Order in Docket 85-105, which, in turn, was based on a Petition for Rule Making seeking such authority, filed by the League. Therein, the League proposed, and the Commission implemented, automatic control provisions only at VHF and above, though numerous commenters in that rule making proceeding suggested that automatic control should be permitted at MF and HF frequencies between 1.8 and 29.5 MHz as well, either on a regular basis or, at least initially, by special temporary authority (STA). The rationale stated at the time was that coast-to-coast coverage for point-to-point message handling networks, which could be done at great speed (but for the local control requirement), would be accommodated by allowing data networks to operate under automatic control on MF and HF frequencies. The Commission was (properly) concerned, however, about the congestion in the heavily used MF and HF bands, and concluded, as the result of that concern, that it would be inadvisable to permit automatically controlled stations on those frequencies without some limitation. The fear was that automatically controlled stations would create interference on frequencies potentially occupied by locally controlled users of other, incompatible modes, because the automatically controlled stations would transmit on occupied frequencies without regard to the status of frequency occupancy.

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Using The Packet Node Network

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To connect to another node you can use either the callsign or the alias. For example, to connect to the SFO:W6AMT node you can use C W6AMT or you can use the alias, C SFO . Either one will work.

There's a special consideration when making connections from a node using the G8BPQ Packet Switch software. Since these nodes are capable of having several different frequencies connected to the one node, you have to indicate which frequency port you want to make your connection on. The PORTS command, abbreviated P, will give you a list of the ports available, such as this:

```
SF:WB9LOZ-2} Ports:
     1 144.99 MHz
     2 223.72 MHz
     3 441.50 MHz
```

You then insert the port number between the C and the callsign, such as C 1 WB6QVU, to indicate which frequency you want to use, in this case the port 1 frequency of 144.99 MHz.

NODES

The NODES command is the second most used command. It can be abbreviated as N, and when entered without any other information, it'll give you a listing of other nodes that can be worked from the node you're using. The list contains both the alias and the callsign of each node. The alias might give you a hint of a node's location, but you should have a copy of the California Packet Resources List available to be able to tell where each node is located. (The CPRL lists are published quarterly by Bob Alexander, AA6UP, and are available on all BBSs in California.) As you move from node to node, the list of nodes you find will vary in length and will contain different callsigns, since all of the frequencies are not linked.

The NODES command has a feature that gives you a simple way to find out how easy it will be to connect to another node in the list. All you need to do is enter N followed by either the alias or callsign of the node that you want to reach, such as:

```
N FRESNO
```

or

```
N W6ZFN-2
```

You'll receive a report showing up to three routes to the node you asked about, how good these routes are and how up to date the information is. If there is no information available, you will receive either "Not found" or the complete node list, depending on the type of node or switch you're using.

Let's take a look at a typical report you would receive after entering N FRESNO. If you were connected to a NET/ROM or TheNet node the report would look like this:

```
SFW:W6PW-1} Routes to: FRES-
NO:W6ZFN-2
  105 6 0 WB9LOZ-2
> 78 6 0 W6PW-6
  61 5 0 WA8DRZ-7
```

If you were connected to a G8BPQ packet switch you would see one less column in the report and it would look like this:

```
SF:WB9LOZ-2} Routes to: FRES-
NO:W6ZFN-2
> 126 6 W6PW-10
  61 3 N6VV-1
  60 4 W6PW-1
```

Each line is a route to the node you asked about. The symbol > indicates a route that's in use. The first number is the quality of the route. 255 is the best possible quality and means a direct connect via hard wire to a coexisting node at the same site; zero is the worst, and means that the route is locked out. 192 is about the best over the air quality you'll find, and it usually means that the node is only one hop away. If you see a quality of less than 80, you'll probably have a difficult time getting any information through via that route. The second number is the obsolescence count. This number is a 6 when the information for this route is less than an hour old. For each hour that an update on the route is not received, this number is decreased by one. A 5 means the information is an hour old, a 4 means that it's two hours old, and so on. The next number, shown only on NET/ROM and TheNet nodes, indicates the type of port. A 0 is an HDLC port; a 1 is an RS-232 port. You don't need to pay any attention to this figure. The callsign is that of the neighboring node that's next in line on the route.

This quick check on a node that you want to reach can save you a lot of time. You'll know immediately whether or not the node is available, and if it is, how good the available routes are to it. You then won't have to spend time trying to connect to a node that isn't available or is of poor quality.

If you find that there's a decent route to the node or switch you want to reach, it's normally best to let the network make the connection for you. Simply enter a connect to the alias or callsign you want rather than connecting to each individual node along the route yourself.

If a route exists but the quality is not very good, you might want to connect to the neighboring node shown for the best route, then do another quality check, repeating this procedure until you find a route with decent quality. You can actually get through to some distant nodes using this method if you have the time and patience to work on it.

ROUTES: The ROUTES command (abbreviated as R) will give you a list of the direct routes to other nodes from the node you're using. The direct routes are the ones where the node can connect directly to the other node. The quality of each route is shown along with the obsolescence count. (See the NODES command above for an explanantion of obsolescence count.) Any route marked with an exclamation point (!) means that the route values have been entered manually by the owner of the node and usually means that the route is not reliable for regular use.

USERS The USERS command (abbreviated as U) will show you the callsigns of all the stations using the node that you're connected to. There are five descriptions used by the node to describe how users are connected:

UPLINK The station indicated is connected directly to the node.

DOWNLINK The node has made a connection from the first station to the second station. Example: DOWNLINK (K9AT-15 N6UWK) would mean that the node connected to N6UWK at the request of K9AT.

CIRCUIT Indicates that the station has connected FROM another node if it's on the left of the <-->; indicates that the station has connected TO another node if it's on the right of the <-->. If you see dashes between the arrows, the circuit is in use. If you see <~~>, the connection is in progress. The alias and call of the other node is shown prior to the user's call. Examples:

```
Circuit (SFW:W6PW-1
WA6DDM) <--> AA6ZV
```

would mean that WA6DDM is using this node, that he connected to it from the SFW node and is now connected to AA6ZV.

```
N6PGH <--> Circuit
(DIA:WB6SDS-2 N6PGH)
```

would mean that N6PGH is using this node and is connected to DIA.

CQ See the section on the CQ command below.

HOST The user is connected directly from the node terminal. This is seen when the owner of the node is a user, or the BBS associated with the node is using it to forward messages.

CQ

The CQ command (which cannot be abbreviated) is used for calling CQ, and it also can be used for replying to the CQ of another station. The CQ command is available only in the latest version of NET/ROM and TheNet.

The CQ command is used to transmit a short text message from a node, and is also used to enable stations that receive the transmission to connect to the station that originated it. The command is entered as: CQ textmessage The "textmessage" is optional and can be any information up to 77 characters long including spaces and punctuation. In response to a CQ command, the node transmits the specified textmessage in "unproto" mode, using the callsign of the originating user as the source and "CQ" as the destination. As with all node transmissions, the SSID will be translated; that is, the SSID will be 15-N, where N is the SSID of the original callsign. WB9LOZ-0 would become WB9LOZ-15, WB9LOZ-1 would become WB9LOZ-14, etc. Here is an example: If user station W6XYZ-3 connects to a node and issues the command: "CQ Anybody around tonight?", the node would then transmit: "W6XYZ-12>CQ:Anybody around tonight?"

After making the transmission in response to the CQ command, the node arms a mechanism to permit other stations to reply to the CQ. A station wishing to reply may do so simply by connecting to the originating callsign shown in the CQ transmission (W6XYZ-12 in the example above). A CQ command remains armed to accept replies for 15 minutes, or until the originating user issues another command or disconnects from the node.

Any station connected to a node may determine if there are any other stations awaiting a reply to a CQ by issuing a USERS command. An armed CQ channel appears in the USERS display as:

```
Circuit <--> CQ(usercall)
   Host <--> CQ(usercall)
or
 Uplink <--> CQ(usercall)
```

The station may reply to such a pending CQ by issuing a CONNECT to the user callsign specified in the CQ(...) portion of the USERS display—it is not necessary for the station to disconnect from the node and reconnect.

An example of what a typical transmission would look like is shown in Example 1. (Text entered by user in italics.)

Users of the CQ command are cautioned to be patient in waiting for a response. Your CQ will remain armed for 15 minutes, and will be visible to any user who issues a USERS command at the node during that time. Wait at least five minutes before issuing another CQ to give other stations a chance to reply to your first one!

BBS

The BBS command (which cannot be abbreviated) is available on nodes using the G8BPQ software where an associated packet bulletin board system is operational. Entering BBS will connect you to the associated BBS.

BYE

The BYE command (abbreviated as B) is available on TheNet and G8BPQ nodes and is used to disconnect you from the node. It does the same thing as disconnecting.

IDENT

The IDENT command (abbreviated as I) found on NET/ROM nodes will give you the identification of the node you're using.

INFO

The INFO command (abbreviated as I) found on TheNet nodes will give you information about the node, usually the alias, callsign and location.

The INFO command (abbreviated as I) found on G8BPQ nodes will give you the identification of the node and a list of the commands available.

MHEARD

The MHEARD command (abbreviated as M) found on G8BPQ nodes will give you a list of stations heard by the node. You must specify which port, by number, that you want the listing for. Examples: M 1 will give you a list for port 1 and M 2 will give you a list for port 2. Use the PORTS (P) command to get a list of the ports and the associated frequencies.

```
cmd: c w6pw-1
cmd: *** Connected to W6PW-1
users
{SFW:W6PW-1} NET/ROM 1.3 (669)
Uplink(K9AT)
Circuit(LAS:K7WS-1 W1XYZ) <-->  CQ(W1XYZ-15)
 Uplink(WB6QVU)           <-->  Circuit(#SFBBS:W6PW-3 WB6QVU)
connect w1xyz-15
{SFW:W6PW-1} Connected to W1XYZ
Hello!  This is George in San Francisco
Hi George!  Thanks for answering my CQ.
.
.
.
```

Example 1: Use of CQ command

PARMS

The PARMS (Parameters) command (abbreviated as P) found on NET/ROM nodes is for the owner's use in determining how his station is working.

PORTS

The PORTS command (abbreviated as P) found on G8GPQ nodes will list the frequencies of all ports available.

EOF

One HAM's 9600 Baud Project

Dennis Matzen, KA6FUB

I got started on a 9600 baud project when the word was put out that we were going to lose the bottom 2 MHz of the 220 band. At the time there was a "Backbone" system linking the gateway BBSs on 220.900Mhz. Because of the actions of the FCC, we needed to redesign the backbone. We decided that we would move to the 433 band (that was allocated for packet at that time), and that it would also be a good time to upgrade the backbone from 1200 to 9600 baud. Me and some other hams started to see what was available for both modems and RF equipment. Many ideas were discussed, equipment evaluated and tests made. My final decision was to use the G3RUH design modem and a Motorola Maxar 80 radio. The decision to use the modem was easy, it was the most popular, easy to install and readily available.

The decision for a suitable radio was not as easy. We looked at many options. The basic requirements are a radio in which the transmitter has true FM with response from DC to 7KHz and a receiver with a similar response from the discriminator. I went a little beyond these requirements by looking for a radio that would be able to function in the high RF environments of the sites they would be installed. We looked at radios such as the Kantronics DataRadio, TEKK radio, and some standard amateur equipment. But between the low power output and/or inadequate design of the receiver, we determined that they would not do well at the sites we were using. So, the Maxar 80 looked like a good choice because of its small size, low cost (they were purchased from used equipment dealers) and were designed very well. I decided to buy two radios and modems and give them a try.

The modems were purchased from PacComm (model MC-NB96) and came with a very good manual that covers installation, setup, theory of operation as well as examples of how to install in different TNC's and to various radios. I installed ours in MFJ 1270's but they will install in any TNC-2 type TNC with a modem disconnect header. The MFJ did not have the header but there is a location on the PC board to install the furnished header. The instructions are very good in the manual, just make sure you cut the traces on the PC board as described in the book. Once installed you need to connect the modem to the radio. The standard PTT lead from the TNC is used and there are two shielded leads that come from the modem for receive and transmit data (be sure to use shielded leads from the modem all the way to the radio).

Initially there were no mods to the radios. The receive data was picked off from the detector IC (U10) pin 6 and transmit data was injected at the PL input pin P. The transmit level was set to deviate the transmitter to 3KHz. All looked fine, but I was unable to connect from one station to the other. Neither modem seemed to be decoding the packets. I checked receive and transmit frequencies, rechecked deviations and receive levels into modems. Everything looked fine but still the modems would not decode the data.

At this point I started to search around for others that had been successful in getting 9600 operational. I found a lot of info on how to hook up radios, set levels and set TNC parameters but I could not seem to find anyone who had gotten anything working anywhere other than on the work bench. I was coming to the conclusion that no one had anything working. I had sent out bulletins asking for help and didn't get much help with that either. Finally I got a short note from John WX3K stating that he thought he had heard of someone back east that may have gotten some sort of Motorola radio working on 9600 by removing some of the crystal filters in the receivers. So I got the TNC and radios back on the bench and checked out the schematic. The receivers had a total of 4 crystal filters. Y20 - Y22 comprised a 4 pole filter and it was very easy to remove them and install a jumper from the input of Y20 to the output of Y22. This left one filter Y23 in the receiver. I modified both radios and gave them a try. I was pleased to see *** CONNECTED on the screen of my computer. They were working!

It seems that the receivers were "too good" for the modem. What it turned out to be is that the receiver had too much Delay spread with the filters installed. Delay spread is the effect of different delays of a signal through a receiver as the frequency is varied, ie a modulating frequency of 500 Hz will pass tough the receiver in a different amount of time than, say, a frequency of 3000 Hz. Our ears can deal with this fairly well but the modem has a real hard time with it. So my data was being corrupted in the receiver IF.

From that point things went rather well. I tested the system first by installing one radio/modem on my BBS and gave the other to my assistant Sysop Brad WA6AEO. That worked out well so one setup was installed at our site in the Oakland Hills and the other was sent to John N6IYA to be installed at his site in the south bay. We determined that the system was going to work at that point so I constructed a total of three more stations to replace all of the old 220.900 backbone nodes.

The final adjustment made to the system was to optimize the bandpass of the modems with jumpers JP1-4 to match the modem to the radios. This was done using two of the setups at the same location following the procedures in the manual. I used an oscilloscope to look at the decoded "EYE" pattern. For the Maxar radios I found that JP1 and JP4 are set to Pos "A" and JP2 and JP3 are removed. This didn't make a big difference in performance, but was worth the time taken in finding the optimal setting.

At least I can say that 9600 baud does work! It isn't quite as easy to get going as 1200 baud mainly due to the fact that you have to get inside that radio to make your connections and possibly some mods. I have seen a lot of info lately on using standard amateur radio equipment (ICOM, Kenwood etc.) for 9600 and many models work fine. For base use these will be fine, but like in our case, it is best to use commercial gear for hilltop use. If I can be of any assistance I can be reached via packet at KA6FUB @KA6FUB.#NOCAL.CA. Also a good source of info is the "9600 BAUD PACKET HANDBOOK" by Mike Curtis WD6EHR @N6YN.#SOCAL.CA. This handbook is available for downloading on many BBS's and is also reprinted in the PacComm MC-NB96 manual.

There isn't a lot of activity on the 9600 user channels yet but as more of us get familiar with what it takes to get set up we should see an increase. Good Luck.

EOF

Confessions of a Hamfest Junkie

Fred Lloyd, AA7BQ

Sometimes, a non-ham friend will ask me, "What is a hamfest". My usual response is, "Well, it's basically a flea market where electronic and ham radio stuff is sold." Sounds deceivingly simple, doesn't it?

Of all the amateur radio activities that I participate in, none gets me more excited than a good, old fashioned hamfest/swap meet. My first swap meet was the famous Foothills Flea Market, which is held once a month during the summer Silicon Valley. Just like the pusher who sold the addict his first fix, the Foothills swap meet has left me forever addicted to the art of buying/selling/trading ham equipment. I'm now destined to return time and time again to fulfill what has become an insatiable appetite for the "junk" bargain of the century.

Several hamfests later, I had finally accumulated enough junk to become a dealer in my own right. Shortly thereafter I bought a folding table, setup shop and became yet another user/dealer of the licit commodity. I must also confess to having inflicted the same addiction upon others, partly to satisfy my own habit as well as to build a network of friends and acquaintances with whom I could trade and barter on a regular basis.

The severity of my involvement became more apparent after I began to attend a monthly electronics surplus equipment auction. There, I would find and buy what certainly looked like excellent junk at prices which seemed to guarantee a profitable future. Yes, I was now buying junk not for myself but for the intent purpose of reselling it at future hamfests — tsk, tsk...shame!

This proclivity has also completely consumed my Monday night homelife, in that a weekly swap net is held on our local repeater at that time. Presently, I'm having a difficult time resisting the urge to subscribe to the Yellow Sheets, while stooping so low as to having been caught reading month-old copies discarded by some legitimate subscribers.

Now, after some 2 years of this activity, I've overcome the denial phase of the affliction and am finally beginning to come out of the closet as a self affirmed, and publicly confessed, "junkie". Now that I've been exposed, I'd like to share with others so that they may profit in both fun and dollars and that they may avoid some of the pitfalls that I've inadvertently discovered along the way.

There are basically two kinds of junkies: buyers and buyer/sellers. Most if not all buyer/sellers started out as simple buyers and like myself, graduated to the dual mode role in time. No doubt many readers of this essay will have attended swap meets themselves and they probably will have heard several "rules of thumb" on how things are done and where the bargains are. In the following paragraphs, I'll talk about some of these rules and about a few others that I've learned on my own.

"Get there early because all the good deals go down before daybreak."

Well, yes and no. Those "good" deals that go down early are often made by two groups: ignorant sellers and smart buyers, or smart sellers and ignorant buyers. Hopefully, you will be on the buying end of the former group. And hopefully, you'll be on neither end of the latter group.

The ignorant sellers are those who are offering a TS-940 for $400. They simply don't know what their stuff is worth and since they haven't toured the grounds yet they're not likely to find out. Should you take advantage of their ignorance? Well, if you don't then someone else surely will. Watch out for basket cases. Don't hesitate to ask the big question, "why are you selling it?". Pay close attention to lot's of uh's and er's in the answer.

How many really hot, smoking deals on late model, expensive gear are out there to be had? Once in a while one comes along, but on the overall, few if any. Most hams know what they have, know what they paid for it and know what it's worth. If you hear a fantastic deal such as "I'm selling this 940 for $400 because I just want to get rid of it..." then buyer beware, there is no free lunch — if it looks too good to be true, then chances are it is. The best value deals will generally be on equipment that is 5 to 10 years old.

Ignorant buyers are those who blindly believe that "the best deals are the early deals" and are predisposed to spending their money no matter what. They will probably buy the first piece of equipment they see which remotely resembles their wants and needs. An informed buyer will have cased the entire swap meet at least once before making an offer on anything. Some buyers will even come out with flashlights as the sellers are unloading their cars hoping to find that elusive deal. Personally, I prefer daylight to flashlight if I'm going to spend anything over $100. I really have to *see* it first.

Experience has shown that prime time at most swap meets is between 8 and 10 AM. Swap meets which start earlier sometimes do some business before 8 but the real crowds, and the real competition (both buying and selling) happens during prime time. Prices never go up as the day wears on, they only go down.

Another "great deal" time is also at or near the close of the event. You can often prey on seller desperation by waiting till closing time or until he's packing up before submitting your insultingly low offer. If he's hungry, he might just take it. Also, many sellers revert to giving things away rather than cart them home. I've picked up and disposed of some good stuff this way.

"I've got a few things to sell. How do I set up a booth?"

A few basic things: Try not to look to professional and try not to look too naive. If you look like the sidewalk sale at K-Mart then many buyers will peg you as a pro and will walk right on buy. If you have your junk heaped in a pile on the ground you'll get plenty of lookers rummaging through it but don't expect to make any money. Try for a middle-ground, soft sell approach. Avoid prepackaged and shrink wrapped items. Avoid store bought price stickers. Arrange your merchandise so that people can easily touch it and gather around it. If you have original equipment boxes, keep them visible but off of the main display (looks too professional).

Don't use a cash box or register. Avoid big, fancy printed signs and advertisements — neat but handwritten notes on index card sized pieces of paper look more sincere. Do everything you can to have at least one other person helping you. You'll need this person to take over

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for you so that you can do some buying yourself and to perform the necessary recon to check your prices. Don't expose yourself to petty thieves. Expensive handhelds should be kept visible but just out of easy reach. At the Flagstaff hamfest last year, one guy stepped up to a commercial display and picked up an IC-24AT and began looking at it. A few minutes later the clerk noticed something awfully strange: the IC-24AT has metamorphosed into an old, beat up, IC-2AT!

Some dealers don't open their booths until after they've had a chance to go shopping first. Some of these guys are very shrewd and will go around buying up a lot of things which will then show up for sale in their booths a little later in the day. I suppose that there's nothing much one can say about this sort of thing but it does tend to rub me the wrong way. Needless to say, these guys are sharks.

"How about pricing and haggling?"

Make no bones about it, you're in a flexible price environment. Both buyer and seller alike are aware of this, and it's expected. Many people won't buy regardless of the price unless they can negotiate for some kind of discount. I've come down as little as 5 percent to make a sale which wouldn't have been made otherwise. Buyers want a deal, regardless of the price.

Never, ever, price your forsale item at your minimum price. Avoid the use of the word "Firm" in your pricing. You can keep the "firm" or lowest acceptable price in your head. If you don't like to haggle then don't expect to sell much, or, if buying, expect to overpay.

Don't be insulted by a 50 percent offer on your asking price — its a typical ploy. A large percent of such offers really mean "I'll give you 75 to 80 percent of what you're asking for." Don't shut your bidder off with a blunt "no" response — unless it's so ridiculously low as to be obviously insincere. Do your best to counter any offer you get. You must show at least a willingness to concede something.

Research your prices before the event. New gear less than a year old typically loses about 20 to 30 percent of its value — Sorry, but it's a fact of life. Nobody is going to buy your "mint" condition rig on a 10 or 15 percent discount off of list. Get the AES catalog — it's the pricing bible for new and late model gear. Gear that's between 2 and 5 years old is typically worth between 50 and 70 percent of its original purchase price. Don't bother consulting those fictional manufacturer's "list" prices, as everybody knows that they're just hype. Older gear is priced at roughly 30 to 50 percent of what comparable new gear would cost. For example, a Kenwood TS-520 (non digital) will go for around $300 while a new TS-140 is about $750.

A note about options such as CW filters, PL encode/decode modules, desk microphones, and other add-ons: sadly, they plummet in value much more rapidly than the gear to which they're attached. When the prospective buyer looks at a piece of used gear, the options add only about 30 percent of their original value to the price, regardless of the age of the equipment. For example, a PL decode unit might cost you about 80 dollars new. It won't, however, add anywhere near $80 to the resale value of the rig. This is especially true for handheld (HT) accessories. $150 dollars of HT accessories will be lucky to net you $50 dollars in resale — when sold along with the rig. Selling them separately does no better, you lose either way.

There are a few brand names which hold their prices better than others. For HF gear, the Big 3 (Icom, Kenwood and Yaesu) hold value over time the best. In used rigs, Collins is the all time leader in resale value retention. Don't get suckered into paying too much for a Collins, because for the same money you could probably buy a brand new transistorized (and WARC capable) rig from one of the Big 3. Drake has a brisk second hand market, especially the newer models. Forget about Swan, Eico, Gonset, most Heathkits, Atlas, Galaxy, and most of the all-tube rigs (except Collins). Lovers of these older rigs please don't take offense, I'm simply stating that their resale values don't hold up very well.

In the classic arena, Hallicrafters, Hammarlunds Johnsons and Nationals seem to be quite well liked. Each brand has a range of models ranging from CB-style cheap to broadcast or mil-spec quality. Prices vary with function, condition, and sentimental value to the current owner.

When selling new, late model gear, some buyers may grunt that your price is too high and that with a new one they can get a warranty. I've successfully countered this argument — and won — by offering to warrant the unit to the buyer myself. It works! This shows that you're 100% confident in the equipment and that it's worth every penny of your asking price.

Here's a potpourri of miscelaneous observations about buying and selling:

- Don't bother with Old Farts who only have one thing to sell. It's usually their dearest old HF rig that they bought new in the mid-70's. You can bet that it's overpriced and that he really doesn't care if he sells it or not. Yes, we know that it's unmodified, that it's been meticulously fed and cared for, that it has the original cartons, manuals and sales receipts, and that he's damned proud of it. But remember: It's still a used rig that's worth the prevailing used price plus at most 10 percent more for being in excellent condition.
- If you're a seller and things are moving really fast, and/or people don't seem to be haggling much, then take note — you're underpricing your merchandise. Don't wait until you're almost sold out to realize this. If you have several of the same item, try to hold a few in reserve for this contingency. If you show a box full of 100 of the same widget, the seller will offer you less than if you only had one or two on display.
- Never get sentimental or emotionally attached to any item. This killer attitude can cost you big $$$. If in doubt, don't. Pause, wait, research and rethink your position before you buy. Don't let the seller know when you are absolutely in love with an item — it'll cost you.
- Find out if the seller is a local ham or not. Bluntly, local hams are less apt to screw people which might hear them on local repeaters. It's one of the peculiarities of this hobby — people talk. It can help you and it can hurt you. Ham gossip travels at relativistic speeds. If you take ad-

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vantage of people, or if you misrepresent your wares, you'll soon be persona non grata both on the air and around town.

- Rigs which come with service manuals: This definitely means that the owner was a tinkerer. It could mean that the rig has or had serious problems. It might mean nothing - just something else to think about.
- When buying old, tube-type gear, be especially cautious of those which utilize TV sweep tubes in the finals — most of them stink. Even Heathkit used 6146's (as did Collins), which are a good indicator of a robust design. When these types of rigs were designed, TV sweep tubes were intended to be a more cost effective solution. Today, sweep tubes cost just about as much as 6146's and so the intended savings is lost. In fact, you'll likely blow two or three sets of sweep tubes before you'll put a dent in a 6146. Just look in an old tube manual (boy, I'm glad I saved mine from the 70's) at the sweep tube ratings. They're junk. Many sweep tube rigs also generate a lot of RFI.
- Most homebrew equipment is worth nothing. About the only homebrew device I would buy would be an antenna tuner — but only if I could see inside it first. Hopefully, it will have a roller inductor.
- Used coax is a gamble. There's no telling how long it has weathered. Watch out for "RG-58" cable that says "30 Volts" on it. It's probably thin ethernet which doesn't even come close to being usable. It's probably OK if it is Belden RG-58 A/U type. The black insulation should be shiny.
- Boat anchors like old test equipment and the like can be a real good buy if you can pick them up for about $10 or less. The more knobs and switches the better. Sometimes the cabinets can be worth quite a bit, especially if you're a builder. There's usually about $50 worth of good, high-quality parts inside these gems. Don't hesitate to scrap what once was a precision piece of test gear — even if it's a name brand like HP or Tektronix. You'll get more for the parts at future hamfests than you paid for the whole unit. Also, your junk box will be well stocked afterwards.
- Save all of the old vacuum tubes that you can get your hands on. An old HP frequency counter, for example, might have 100 tubes in it. There are virtually no tube manufacturers left and these old pulls will soon be in very high demand. I picked up a very good tube tester with charts for $2. I have since found it to be indispensable.

Well, that about brings me to the end and I hope that you will find this information useful and/or interesting. The comments and observations given here are my own and your milage may (will) vary. Have fun and see you at the next swap meet.

-fred, AA7BQ

EOF

NOSintro Book Available

CAPRA — the Chicago Area Packet Radio Association has arranged to obtain a supply of Ian Wade, G3NRW's new TCP/IP primer — "NOSintro." Reviews of this book have been quite good.

This 356 page book is a hands-on tutorial with documentation regarding TCP/IP and NOS software version of this international standard as implemented for use with amateur packet radio operations.

An earlier posting listed all of the 35 chapters of the book which outline the basics and more advanced topics of TCP/IP; there are 6 Appendices with additional reference materials and information. The book has over 80 detailed diagrams with "countless examples of commands and screen displays."

We expect to receive the books and mail them prior to the end of March, 1993. In the event that this is not possible due to unforseen circumstances, we will notify you if we expect delays beyond April 15, 1993.

The books will be shipped via U.S. Postal Service's 2nd Day Priority Mail service upon receipt here in suburban Chicago.

Ian Wade, the author, has given us a discount for our quantity purchase. The cost to you will be $22.50 which is slightly under the total cost which you would have were ordering directly from the publisher in the U.K.

This is NOT a money making undertaking on the part of our group. Many of us are active on TCP/IP and feel that this is a way to increase the awareness of and technical expertise of others who may be interested in or who are currently using the protocol in amateur radio circles.

Send your complete mailing address, a telephone number at which you can be reached should there be a problem, and a check/money order made out to CAPRA in the amount of $22.50. Mail it to:

CAPRA — Chicago Area Packet Radio Association Post Office Box 8251 Rolling Meadows, Illinois 60008

Please — no requests for information, orders, etc., via amateur packet radio resources.

73 de Jim, N9GBH
CAPRA Vice President
jchesner@holonet.net

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5. In the Commission's Report and Order in Docket 85-105, there was a strong reaffirmation of the limitations on automatic control of third-party communications. The League, among others, noted that those limitations effectively precluded the developing use of digital modes, and especially packet, using the AX.25 protocol. That was the digital mode which was growing most rapidly at the time, and which offered great promise for data networks at VHF and above. In response to a petition for extraordinary relief filed by the League following the Docket 85- 105 Report and Order, the Chief, Private Radio Bureau, excepted intermediate stations in a network, using the AX.25 protocol, from the general prohibition of the conduct of third-party communications while a station is under automatic control. Thus, stations could operate under automatic control when retransmitting third-party traffic at VHF and above using the AX.25 packet protocol. The Commission determined that the safeguards in such operation were sufficient to protect the Amateur Service against commercial encroachment.

6. Several reconsideration petitions filed in Docket 85-105 requested rethinking of the prohibition of automatic control of digital communications below VHF. Those petitions suggested that automatic control at HF frequencies using digital modes was reasonable and necessary to facilitate rapid wide-area message handling, especially for disaster relief communications. The League suggested that permanent authorization for such would be premature while operating standards for packet and other data modes were still rapidly evolving. A better approach, said the League, was to coordinate a small group of data communications enthusiasts, and for the League to request special temporary authorizations (STAs) for the group, thus to determine the feasibility of permanent authorization of such operation by rule. The Commission agreed with this approach, and dismissed the reconsideration petitions, stating: With respect to the matter of authorizing automatic control of amateur stations transmitting digital communications below VHF, we will defer further consideration of such expansion. Organized feasibility projects conducted by a manageable group of amateur stations such as that planned by ARRL will be helpful in determining any rules necessary to prevent interference to and from other amateur operations.

7. In June of 1987, the League filed an STA request, seeking authorization for automatic control of certain specified HF packet stations constituting a message-handling network to be known as SKIPNET. The Commission granted the STA for an initial 180-day period, and has renewed it continuously since, to permit continued experimentation while urging development of permanent rules for automatic control of HF data communications. The current extension thereof is effective until February 3, 1993. The Chief, Private Radio Bureau noted in a recent letter extension of the STA that the Commission did not contemplate further extension of the STA without a concurrent proposal for permanent rules for automatic control of HF data communications. The concern about the continuation of the STA was not at all based on the level of success of the experimental operations conducted pursuant thereto. The STA, by all accounts, has worked well, and has revealed both the strengths and shortcomings of data protocols, modes, and utility of certain data communications at HF. The STA was useful, and the patience and cooperation of the Private Radio Bureau in permitting and continuing it was and is well appreciated by the amateur radio community.

III. RM-7248 and The League's Survey

8. After the grant of the League's STA in mid-1987, while the experimenters were working to develop operational standards for automatic control of data communications on HF bands, the Commission commenced a review of the Amateur Radio Service Rules in Docket 88-139, looking toward a restatement of the rules to permit, among other things, the flexibility to accommodate newer (data) technologies. The League noted in that proceeding that neither the Commission's proposed restatement of the rules, nor the League's proposal for a slightly different restatement, could constitute any "final" version thereof. It was recommended that the Commission leave the matter of new rules governing data communications for a separate proceeding. This the Commission chose to do, avoiding any substantive changes in data communications rules in that proceeding.

9. Based on the results of the STA operation between mid-1987 and the end of 1989, the League filed a Petition for Rule Making, RM-7248, on December 12, 1989. The petition proposed amendment of numerous rules in Part 97 to permit automatic control of HF data communications. It proposed that automatically controlled stations would be limited to specific subbands. The subbands chosen were in accordance with the IARU Region 2 band plan that was in existence at the time. The Commission placed the petition on Public Notice, and a relatively large number of comments were filed, most of which stated opposition to the petition as filed.

10. Even so, the concept of automatically controlled HF stations transmitting data communications was not unpopular generally. Most comments on the petition asserted that the specific choice of rule-imposed subbands for automatically controlled data stations was not acceptable. This aspect of the petition proved difficult to address, because the League felt obligated to propose subbands consistent with internationally accepted band plans. The unacceptability of the subbands chosen, however, resulted in a decision to withdraw the petition in order to rethink the matter. It was difficult to reconcile the apparent need for rule-imposed subbands for automatically controlled MF and HF data operation (for interference protection for other modes, and the compatibility of certain data modes with other data modes) with the need to avoid incompatibility with data operation in other countries in Region 2. As the League noted in its letter to the Chief, Private Radio Bureau, requesting dismissal of the petition (without prejudice), the pleading cycle on that petition was useful to the Amateur Radio Service in that it brought certain issues to the League's attention, issues which have since been rethought in detail.

11. Following the withdrawal of RM-7248, the League studied the options for automatic control of HF data communications through the work of committees of amateurs interested in the matter, as well as through the collective experience of the STA participants. In January of 1992, the League published in its monthly journal, QST, a survey, asking

its members to respond to specific questions in order to plan automated data message systems below 50 MHz. The survey, and the tabulated results thereof, are attached hereto as Exhibit A. The survey described configurations of systems of data transfer between and among stations, and asked which, if any, were deemed suitable in the Amateur Radio Service at HF frequencies, given the need for prevention of interference, and for self-enforcement against intruders. The survey stated, in part, as follows:

It is possible for an unattended automatic digital station to work another station that is being controlled by an operator who is present and can listen to the frequency that is to be used to ensure that it is free before initiating a contact. In this style of operation, the frequency can be shared by more than one digital mode. Setting the frequency aside for a specific digital mode is not essential...RTTY and AMTOR MBOs typically operate in this mode. It is also possible for an unattended automatic digital station to work another unattended automatic station. In this style of operation, the frequency used must be set aside for the specific digital mode the stations are using at the time such communications are to take place. Sharing the frequency with another mode is not possible since there is no practical means of listening to the channel to determine if the channel is already in use by another mode of signal...Packet BBSs typically operate this mode.

It was also noted that all digital modes are capable of either type of operation. Obviously, all digital modes can be conducted under local or remote control as well, though such a requirement significantly slows data transfer, and precludes exploration and use of the full capabilities of the data modes in network configurations. With respect to certain modes, local control adds little in terms of real-time monitorability of communications through the network of data stations, other than with respect to interference to other users of the same frequency bands.

12. There were 507 respondents to the League's survey. The results of the survey, and all written comments, were carefully studied by the League's committee, and the results tabulated as per Exhibit A. The results of the survey substantially supplemented the information contained in the comments filed in response to RM-7248. The combination of those sources, and extensive committee work since then, led the League's Board of Directors to a series of conclusions, which were discussed at length in July of 1992. The tenor of the survey responses reflected concern over interference from automatic control on HF bands, and was surely colored by the previous League proposal for creation of subbands that conflicted with users of other modes. In any case, it was clear that there should be no automatic control at random at HF. There was a split of opinion as to whether automatic controlled stations should be limited to communication with stations under local or remote control, or whether automatically controlled stations should be permitted to communicate with other automatically controlled stations. Regardless of the type of automatic control operations permitted, however, survey respondents believed that any such operation should be within specific subbands.

13. The survey results indicated significant opposition to allowing automatically controlled data stations at HF to communicate at random on HF frequencies, because to do so would create a significant possibility of interference to ongoing communications using other modes. Though the commenters in RM- 7248 had made clear that the subbands earlier proposed by the League were not universally acceptable, the results of the League's survey indicated that if any stations transmitting HF data are permitted to be operated under automatic control, they should be permitted to operate only in specific subbands. Thus, the League was left with the dilemma of its obligation to comply with the band plan for such established by international agreement, and the rejection of the same by United States amateurs.

IV. "Semi"- Automatic Control

14. By mid-1992, after the League's survey, it was apparent that automatically controlled HF data communications, if at all, should be conducted in specific subbands only. It was also apparent that the amateur community was not unanimously agreed as to the type of automatic control to be authorized, if any, for HF data. It was decided by the League's Board at that time that the Commission should not be asked to permit automatically controlled stations to communicate with other automatically controlled stations, because such appeared from the survey to be inadvisable outside of specific subbands (for interference reasons). And, as discussed above, the creation of subbands by rule was problematic at that time due to the fact that the subbands for automatically controlled HF data communications contained in the IARU Region 2 band plan in effect at the time had proven unpopular to a number of United States amateurs when the League proposed it in RM- 7248). The League decided therefore to propose that automatically controlled stations in the MF and HF bands not be permitted to communicate between, or among, themselves. Rather, such stations would be limited to communication with stations under local (or remote) control, and that the subbands for such operation be left to voluntary band planning.

15. This compromise plan, however, was not put forward in any petition to the Commission, as it was criticized as unworkable (and unacceptable to certain participants in HF packet networks) as soon as it was announced. Its restrictions constituted distinct limiting factors, which would preclude to a great extent the full utilization of the communications opportunities offered by the technology. Relay of data messages between and among automatically controlled stations is far more efficient and rapid than networks made up of a combination of automatically controlled stations and locally or remotely controlled stations. Thus, in August of 1992, the League's Executive Committee asked the Committee on Amateur Radio Digital Communications to revisit the issue once again, which it did in late September, together with a representative group of the STA participants.

V. The Revised IARU Band Plan for HF Data Communications

16. Fortunately, the development of internationally agreed-upon subbands for automatically controlled HF data communications was greatly facilitated at the IARU Region 2 General Assembly held in Curacao, Netherlands Antilles, in early September, 1992. That meeting, which included representatives of national amateur radio societies representing 38 countries in IARU Region 2, produced a substantially revised HF band plan. The new plan included segments in HF bands in

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which automatically controlled data communications could be conducted with less risk of interference to other, incompatible modes. This band plan superseded the prior plan, and represents a provision for such operation which is fully compatible with that of the other two IARU regions. It is substantially different from the band plan previously in existence when the League prepared RM-7248. The new IARU band plan provides segments on each amateur HF band for digital modes, including RTTY, AMTOR and Packet, defined as including new systems such as CLOVER and PACTOR, but excluding Facsimile and SSTV. CW would continue to be a permitted mode throughout all amateur bands.

VI. Automatic Control and Interference Concerns

17. RM-7248 had proposed simply that any amateur station authorized to use data communications on HF frequencies could operate under automatic control while transmitting data communications, provided that such was conducted on specific, rule-imposed subbands. With such an approach, as it appears, the principal problem noted was that some of the subbands chosen (which were selected for consistency with the then-appertaining IARU Region 2 Band Plan, as discussed above) were already occupied by stations using operating modes that were incompatible with certain other data modes. Subbands were deemed necessary for interference avoidance because, in bands where incompatible operating modes shared the same frequencies, automatically controlled stations could communicate with each other in a network, without "listening" to a frequency to first determine if it is in use before transmitting. Sudden transmissions could interrupt an ongoing communication in a non-data mode. The fear of those in opposition to RM-7248 was that interference would result to preexisting, regular communications in the proposed subbands. Modes such as RTTY, which are incompatible with certain other data modes, would potentially receive interference. The RM- 7248 commenters were, quite reasonably, concerned about disruption of existing operating patterns and band usage by stations within the proposed automatic control segments using incompatible modes.

18. Compounding this problem are several unalterable circumstances relative to HF operation generally. First, amateur HF allocations are heavily occupied by amateur stations using various modes of operation. Second, there is a continuum of change in HF propagation. Changes in propagation paths and signal strengths can and often do occur so suddenly that an ongoing communication between two stations (in any mode) may be neither causing nor receiving interference one minute; but the next minute, due to propagation shifts, harmful, even preclusive interference can appear to or from another communication on the same or adjacent frequencies. Third, there is no "channelization" in the HF amateur bands (as indeed there should not be, for reasons not necessary to explore herein). Because the subbands for automatically controlled data stations proposed in RM-7248 included segments in which certain operations were already firmly established, and given the above factors, it is understandable that some amateurs were concerned about the disruption of existing communications that would result from the RM-7248 plan.

19. The above circumstances do not uniquely affect automatically controlled stations. The phenomenon is present in varying degrees where numerous modes of operation share limited frequencies. However, the incompatibility between certain data modes and other amateur operating modes would be quite apparent at HF, if automatically controlled stations in crowded bands were allowed to transmit without an interference avoidance mechanism. It is inevitable that any band segment in the HF amateur spectrum is (at least until differing operating patterns evolve), going to be shared among differing modes of operation. This is not a new condition on the HF bands, and the phenomenon has been accommodated for decades by cooperation among amateurs. The crowded conditions, however, and the inability of an automatically controlled station to "listen" prior to transmitting to prevent interference, dictate some element of control, by creation of specific subbands. If messages are to be passed between amateur stations without any operator intervention and no operator present at either station, it will have to be done on frequencies where amateurs expect such operation. Otherwise, random automatic control of data stations at HF would undermine the degree of cooperation in interference avoidance that HF operation, by its nature, has always required. If automatic control operation is allowed only in subbands created by rule, the problem will still exist to a minor extent, until revised operating patterns emerge. However, by designating small subbands for automatically controlled data operation, there will be advance notice to amateurs operating in that segment that automatically controlled data stations may commence transmissions. From the point of view of other stations operating in that subband, operators would have advance notice of the possibility of interference to communications using an incompatible transmission mode. Data communications outside those subbands would be limited to local control, thus providing the necessary degree of manual interference avoidance.

20. In addition to the inevitable loading of the HF bands and the characteristics of HF propagation, there are some essentially immutable principles of HF operation contained in the Commission's rules that bear on the concept of automatically controlled HF data communications. The first is that an amateur station may not willfully or maliciously interfere with or cause interference to any radio communication or signal, regardless of the mode of operation or the perceived importance of the communication in progress. The second is that no frequency will be assigned for the exclusive use of any station, and thus no station, regardless of operating mode, has any greater right than any other to the use of a frequency. These operating principles are, at the present stage of development of data communications, somewhat at odds with the concept of automatic control of data stations at HF. Such operation, by its nature, is mode-specific, and automatically controlled stations will not necessarily be able to determine whether the frequencies on which they transmit are occupied by a station using another mode at the time they commence a transmission. Sharing, and the "cooperation" necessary to interference avoidance are, under present technology, difficult to implement.

21. Notwithstanding all of the above, as discussed above, there remain good and sufficient reasons why automatically controlled data communications at HF should be authorized. Automatically controlled HF operation is absolutely essential to the handling of National Traffic System emergency and public service messages between amateurs through intermediate stations. HF data communications have provided a marvelous means of rapid data transfer in emergency communications, and the ability to do so over long distances rapidly requires the use of automatically controlled HF stations to move the data through the system, between and among locally controlled stations. The infrastructure for this system, to move this traffic, must be operational in advance of any emergency, when the need for its use becomes acute. In addition, such operation permits amateurs nationwide and worldwide to exchange communications when there is a time difference between the operating times available. It permits the quick relay and exchange of reliably transmitted messages, avoiding the delay inherent in coordinating operator schedules in keyboard-to-keyboard operation. Further, it permits management of peak load requirements in the crowded HF bands by shifting automatic message forwarding to times of day when fewer operators of other modes are active. Moving messages at machine speeds, without the delays and interruptions in relaying messages caused by the unavailability of network link stations (due to the vagaries of operator schedules), is far more spectrum efficient and makes more frequency time available for other types of communications, including direct keyboard-to-keyboard communications.

22. Finally, and not to be lost in the above discussion of the practical amateur uses of automatically controlled HF data stations, is that the development of new software and hardware to refine the technology and further new types of data communications and data networks requires that at least some amateur stations in a network be permitted to operate under automatic control in the HF amateur bands, and that some automatically controlled stations be permitted to relay signals to other stations also under automatic control. Operation pursuant to the League's STA has shown that automatic control of HF data communication is workable and should be permitted under conditions sufficient to prevent interference to other amateur stations in the same HF bands using other emission types and modes.

VII. A Regulatory Approach for Automatically Controlled Data Communications

23. Because some automatically controlled HF data operation is necessary and desirable; because it is more difficult at HF frequencies than at VHF and above, in terms of interference avoidance, to have two or more automatically controlled stations communicating with each other in other than specified, regulated subbands; and because the creation of subbands by rule for automatically controlled HF data communications is now workable, consistent with an accepted, revised band plan that is standard throughout the world; the League now recommends the following:

(1) Consistent with the frequency privileges and other operating limitations applicable to the license class of the operator, any amateur station may be operated under automatic control using any accepted protocol for data transmissions within the frequency segments specified in the attached appendix. Such stations should be equipped with means to limit transmissions to no more than five minutes in the event of an equipment malfunction or interruption of contact with another station. Third party communications may be transmitted under automatic control using any 97.309(a), provided that the retransmitted messages must originate at a station that is being locally or remotely controlled.

(2) HF data operation should be permitted outside those specified subbands as per current rules, but only under local (or remote) control. Under this dual regulatory plan, automatically controlled stations transmitting data communications would be permitted to transmit only in the specified HF subbands. Stations transmitting data communications outside the specified subbands must be under local or remote control.

24. Such an arrangement would require that a licensee confine automatically controlled station functions to the specified subband, where there is less likelihood of unexpected interference with other amateur communications using incompatible modes. Data communications under local control, where the operator would ascertain that no interference is likely to ongoing communications before transmitting, and to monitor the progress of communications, could be conducted, consistent with volunteer bandplans, anywhere the present rules permit such emissions. Within the subbands, an automatically controlled station would be required to have an appropriate provision or mechanism to discontinue operation quickly in the event of malfunction or loss of contact with another station, as current rules for automatic control now require. Cooperative use of frequencies and the exercise of station control demand no less.

25. The League has proposed the instant approach for authorization of HF automatic control after much study and discussion, and based upon a recent, significant reconfiguration of the band plan for such operation agreed upon by IARU Region 2, reperesenting 38 amateur radio societies in the Americas. The attached appendix lists, as proposed subbands for automatically controlled HF data communications, a subset of the frequencies available under the IARU band plan for such use, in order to minimize any impact on other users of the HF bands. It is firmly believed that there should be permitted some automatic control authorization at HF frequencies. It is not now apparent, and the League is not now prepared to suggest that any additional data operation under automatic control be permitted at HF outside the proposed subbands, though further study of the matter is ongoing. Thus, at present, regardless of the function of the automatically controlled HF data station in a network, and whether it is being interrogated by a locally controlled station or is part of a series of automatically controlled links, all such operation should be limited to specific subbands. This plan will permit all amateurs the flexibility to experiment with digital communications modes and their applications, while protecting other stations against undue interference.

26. The specified subbands contained in the attached Appendix should not suffer the same criticism levied by certain commenters in RM-7248. The newly revised IARU Region 2 band plan has provided for subbands for automatically controlled HF data communications that are consistent worldwide, and

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ARRL Proposes New Rules for HF Packet

Continued from page 13

are small enough to minimize displacement of established operating patterns using other modes. Because the proposed subbands are consistent with amateur practice worldwide, it is unlikely that the rule- imposed mode subbands would soon be rendered obsolete by changes in operating patterns. The provision of small subbands for automatically controlled HF data operation would, as well, serve to encourage the development of and conversion to newer technologies by amateurs as more, and newer, digital modes are introduced and more amateurs shift to digital communications. The League believes that the gradual development of amateur radio operating patterns will continue to occur; that these changes should be due to natural migration as a larger percentage of amateurs shift to digital modes; and that the Amateur Radio Service should be permitted to develop and explore these various modes, and their capabilities. These adjustments and sharing arrangements should be facilitated by the regulatory approach set forth herein. Such will allow specific subbands to support networks of automatically controlled stations, and, in addition, a flexible regulatory environment outside those subbands, where locally controlled stations can operate using available modes.

VIII. Enforcement Issues

27. In addition to concerns about interference prevention, a few of those who filed comments in RM-7248 expressed concern about possible abuses, or unlawful use of the data networks. They asked whether automatically controlled HF data operation would contribute to such a problem, or at least make enforcement difficult. The concern about abuses related principally to third- party traffic communications. The League is not aware of any pattern of such abuse, nor does it see any reason why unlawful operation is any more likely while a station is under automatic control than when two stations are operating under local control. Automatic control does not equate to an absence of control, nor diminish the responsibility of a licensee or control operator. Current rules as to a licensee's obligation to assure proper control are sufficient to inhibit any unlawful operation.

28. The Commission authorized automatic control of amateur digital communications on and above the amateur 50 MHz band in 1986. Such stations were authorized to retransmit third-party traffic. That authorization now appears at Section 97.109(e) of the Rules, but limits such retransmission to packet stations using the AX.25 protocol. In adopting that authorization, the Commission quoted the League, relative to supervision of station transmissions, stating as follows:

> The question of risk versus benefit in considering manual control throughout an amateur packet network while handling third party traffic should be resolved in favor of the benefit of the efficient functioning of the network. In the opinion of the League, the widespread public benefit of having a high-speed packet radio network with the capacity of handling major emergencies far outweighs the narrow risk of unsupervised use of the network by unlicensed persons.
>
> 61 RR 2d 347, at 348 (1986)

This same rationale is applicable to other digital communications as well as packet radio transmissions. The League, during the period of the special temporary authority for HF automatically controlled stations, noted no instances of initiation of messages by non-amateurs. That was the stated concern of the Commission in addressing the issue of automatic control of digital communications in 1986. It has proven, both at VHF and UHF, and it is the experience of the League from the STA, that enforcement in this context is not a significant problem, and certainly not one which should inhibit the development of new data communications techniques and networks for use in emergencies.

29. Thus, the League suggests that Section 97.109, which currently prohibits automatic control of an amateur station while transmitting third party traffic (except packet stations using the AX.25 protocol on the 6-meter and shorter wavelength bands), be changed so as to permit RTTY and other data modes under automatic control on HF frequencies as well as at VHF and above.

IX. Conclusion

30. The Amateur Radio Service has greatly benefitted from the Commission's accommodation in issuing and renewing the automatic control STA. Also useful have been the STA participants, the comments in RM-7248, the recent survey conducted by the League, and most especially the work of its Committee on Amateur Radio Digital Communications. It is apparent that the amateur community favors the use of automatically controlled data stations on HF only under certain circumstances. The development and adaptation of new, efficient data technologies have been facilitated by the use of automatically controlled stations, which more than justifies the permanent authorization of such. There is, however, uniquely in the HF amateur bands, at the present time, a need to restrict such operation to specific, mandatory subbands, in order to avoid interference to users of other modes in the crowded HF bands. While the League's proposal for regulated subbands for automatically controlled data operation will not prevent all interference, it would insure, to the extent practicable, that interference is not created by the commencement of data transmissions from automatically controlled stations except in segments of bands where such may be expected by other users.

31. There are no significant enforcement problems associated with operation under this arrangement, and it is unnecessary to restrict the modes of data communications which can be used at HF and MF under automatic control. Nor is it necessary to preclude third-party communications, which are conducted during emergencies and in public service communications contexts. International third- party traffic rules would apply as they do to other types of amateur communications.

Therefore, the foregoing considered, the American Radio Relay League, Incorporated respectfully requests that the Commission issue a Notice of Proposed Rule Making at an early date looking toward the authorization of automatically controlled HF data communications under certain circumstances, as per the attached Appendix.

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NCXPN Meeting Minutes

Brad Watson, WA6AEO
NCXPN Coordinator

Here are the minutes of our 3/7/93 NCXPN/Sysop meeting:

WA6AEO : Review/adoption of the BBS coordination policy, final draft having been sent out to Sysops over packet.

Resolution : New BBS coordination policy was adopted, after a couple of minor changes.

WA6AEO : Verify RAU will continue as BBS Coordinator. Discuss what will be in the "Coordination Package" sent to applicants. BBS Coordinator v. BBS Registrar.

Resolution : AEO will work with RAU on the "Coordination Package". It will include the current BBS List, Sysop addresses and phone numbers, the Coordination Policy, and other information about operating a BBS. It was agreed that the BBS Coordinator and BBS Registrar should be the same person. With the new procedures in place, the job of the BBS Coordinator should be well defined.

N0ARY : The PBBS issue. Should we change our handling of PBBSs, how should routing of these messages be accomplished.

Resolution : Considerable discussion about PBBS's. There will be no change at this time on our handling of PBBS's - forwarding and routing to them will be done on the local BBS level only. PBBS's should not send headers. No NORCAL BBS should change @BBS field.

WA6AEO : The number of OLD bulletins flooding our network. Should we adopt a policy regarding bulletins entering NORCAL.

Resolution : We will "old" bulletins after 5 days. All Sysops should set their systems to not forward them after 5 days.

N0ARY, WX3K : The usage of internet as a forwarding medium. What the bbs authors have been doing in establishing a specification. Third party packet messages flowing via internet.

Resolution : The general consensus was that forwarding via internet was OK by us. N0ARY assures that safeguards are in place to prevent non-hams from using the GateWay. Since third-party agreements only concern our radio forwarding, internet traffic would not be a problem to/from countries which we don't have agreements with.

WX3K : Need for another HF gateway to handle MAIL, not bulletins.

WX3K : WX3K sked out of country for 90 days. Need a standby for 14.111. STA will cover.

Resolution : WA6HAM in Pittsburg will fill in for WX3K during his absense.

WD6CMU : Discussion of planned temporary shutdowns by WX3K and WD6CMU in March and alternative routings.

Resolution : W6PW will handle the NBAY GateWay duty while CMU is gone. KC6PJW will handle WX3K's users while he is away.

WX3K : 9600 ops. What's the poop?

Resolution : The Backbone is working well, all nodes are now up and running. SACVAL is now on the backbone. SBAY is working with EBAY to uplink to #SFO3 on Crystal Peak.

WX3K : Bulletin distributions. @WW distribution. Help or hurt? Good or bad? Should we organizationally not permit SALE @ ALLUS into/out of #NOCAL?

Resolution : Some of our users like @WW, so we keep. If your software permits, filter SALE@ALLUS and SALE@WW and/or @WW and @ALLUS with SALE in the subject.

WX3K : Sonoma LAN has heartburn with SOLMV, a high altitude node. Freq shift review time?

Resolution : WA6HAM will lock out route to SOLMV to minimize that nodes access to the network.

N0ARY, WA6AEO - Getting more of the sysops to attend meetings. The decisions we make are potentially far reaching. One example was our decision a year or so ago to send all overseas mail via satellite. A year later users are still complaining about their mail going via HF. Sysops are also complaining about the meetings not being centrally located, but it seems they are considering all the areas we are coming from - and the extenuating circumstance of the availability of a place to meet.

Resolution : It is noted that attendance at this meeting was better than to previous meetings. The Pleasant Hill location is recognized to be REASONABLY centrally located for many sysops. Our next Sysop meeting will be held on a Saturday, since some folks are having a problem with Sunday.

AA4RE - Header rewrite programs and the messages we are losing because of them.

Resolution : At least until problems can be fixed resulting from these "rewrites", it is the policy of NCXPN that all systems should turn this OFF. This applies to RLI systems. Please be sure your switch in INIT.MB to "Normalize all headers" is set to NO.

WB9LOZ - WP Updates: Are updates being forwarded from RLI boards to W6PW? Are updates being forwarded from RE boards to WD6CMU? (CMU, in turn, converts them to RLI format and sends them to PW.) Are all boards that want WP updates receiving the daily updates sent to WP @ NCWP < W6PW?

Resolution : WP and NCWP are working pretty well. KE6LW reports not getting update's. AEO will contact RDH about this.

WB9LOZ - Bulletin forwarding: Are all LANs forwarding bulletins to all of the other LANs? How are bulletins addressed @ALLCA, @ALLUSW and @ALLUS being forwarded to CENCA and SOCA BBSs? The reason for these questions is that some bulletins seem to be arriving by very roundabout paths.

Resolution : We believe the bulletin forwarding system is sound, but sometimes overloaded. With a new NCGATE distribution, the GateWays will work with each other to be sure bulletins are flowing the best way possible through our local nets.

WA6AEO, WB9LOZ - The state of our backbone. How is it working now? Is traffic flowing with reasonable speediness. How about forwarding times, do we want to coordinate? What about putting more effort into developing better backup paths that are in place and ready when needed? N6IYA suggests that maybe we want to consider other ideas for our backbone, alternative ways for it's configuration that could improve thruput. Should we start planning long-term for further network development? Who pays for it? WHO DOES THE WORK?

Resolution : As stated above, the Backbone is working reasonably well currently. There are things that could be done to make it better. We hope that, with the concerned technical people in attendance, the next NCXPN/Sysop meeting can be a forum to discuss the future of our Backbone and network connectivity.

WA6AEO - Propose new designator for NORCAL GateWays. This way the GateWays can keep in better contact with each other, and let each other know of routing changes without having the whole network concerned. Suggest NCGATE or the like.

Resolution : GateWay sysops and their alternates should create a NCGATE distribution designator. WA8DRZ should also be included since he is NBAY/SBAY intermediate forwarding. This should not go to non-GateWay BBS's.

N6IYA - Another issue not on the agenda - who is the gateway for the other LAN...ie GARLIC...WB6ZVW or AA4RE...it has got to be one or the other but not both...I see both stations fwding bulletins to me and i get dups of traffic here because of it...

Resolution : WB6ZVW should not be acting as GateWay when AA4RE is on the air. Further discussion then ensued about OTHER LAN and other 2-meter forwarding. The group noted that this issue continues to come up, with no final resolution. It was decided that those guilty of this need to be contacted, and they need to let us know of a REASONABLE timetable when this will stop. The group intends to have some resolution to this by it's next meeting, probably this summer. Action taken at that time may include sanctions, if satisfactory arrangements have not been made. AEO will contact the parties involved, querying them of their intentions. We are concerned about the OTHER LAN 2-meter forwarding, N6IYA/N6MPW-1 2-meter forwarding, and the N6QMY/K3MC 2-meter forwarding.

WA6AEO - The matter of messages in foreign language was brought up.

Resolution : Comment was made that legally speaking you are responsible for what goes thru your station, of course. The FCC probably only requires action on specific issues, if a situation arises you are responsible to correct it and to always respond adequately to commission concerns. You would probably not be held liable for something going thru your station you knew nothing about, except to take care of it when it's called to your attention. However, it is always up to the discretion of individual Sysops as to what they are comfortable with.

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Northern California Packet BBS Coordination Procedure

Brad Watson. WA6AEO
NCXPN Coordinator

This is the procedure to be followed when applying to join the network as a new Bulletin Board station, or if you have significantly changed your configuration and require recoordination.

1. It is the responsibility of the applicant to contact the NCXPN BBS Coordinator, and request a new sanction.
2. The BBS Coordinator will send the applicant a "Coordination Package," consisting of the current NCXPN BBS listing, this policy statement, as well as other items of use during the sanctioning process.
3. The BBS Coordinator will instruct the applicant to contact the GateWay operator, all Sysops on the same frequency, and any other Sysops affected by his proposed operation.
4. The BBS Coordinator may also make suggestions as to whom to contact. The BBS Coordinator is in no way obligated to make such suggestions, nor is he required to mediate such contacts.
5. The applicant will contact the GateWay and any cochannel Sysops affected by his operation to attain their assent to his operation. If the GateWay or Sysops have concerns, the applicant will make every effort to privately resolve them. The applicant will thoroughly document all efforts to resolve such conflicts.
6. Upon acquiring the consent of GateWay and cochannel Sysops, the applicant will notify the BBS Coordinator. The BBS Coordinator will verify that the proper consent has been attained.
7. The BBS Coordinator will make a public notice regarding the new application, and solicit comments for a two week period. All comments should be to the BBS Coordinator, in private.
8. The BBS Coordinator will advise the applicant of any concerns raised during the comment period. It is the responsibility of the newcomer to privately resolve these concerns, as well. The applicant will thoroughly document all efforts to resolve such concerns.
9. The BBS Coordinator will again confirm that all conflicts arising during the comment period are resolved.
10. The BBS Coordinator will present any disputes that cannot be resolved to the NCXPN for resolution at its next meeting. At that time, the efforts documented in steps 5 and 8 above will be reviewed and weighed.
11. The BBS Coordinator will then make public notice of the new coordination, at which time the applicant shall be considered coordinated.

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ARRL Proposes New Rules for HF Packet

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Respectfully submitted,

THE AMERICAN RADIO RELAY LEAGUE, INCORPORATED
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General Counsel

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February 1, 1993

APPENDIX

1. Sections 97.109(d) and (e) are amended to read as follows:

Section 97.109 Station Control.

(d) When a station is being automatically controlled, the control operator need not be at the control point. Only stations transmitting RTTY or data emissions, and stations specifically designated elsewhere in this Part, may be automatically controlled. Automatic control must cease upon notification by an EIC that the station is transmitting improperly or causing harmful interference to other stations. Automatic control must not be resumed without prior approval of the EIC. RTTY and data stations operating under automatic control on frequencies below 50 MHz must use a digital code permitted in 97.309(a) of these Rules, and must incorporate provisions for discontinuing transmitter operation in the event of malfunction, or interruption of communications with another station.

(1) Stations transmitting RTTY or data may be operated under automatic control in the 6 meter and shorter wavelength bands, and in the following segments of the 10 meter and longer wavelength bands: 28.120-28.189 MHz; 24.925-24.930 MHz; 21.090-21.100 MHz; 18.105-18.110 MHz; 14.095-14.0995 MHz; 14.1005-14.112 MHz; 10.140-10.150 MHz; 7.100-7.105 MHz; or 3.620- 3.635 MHz

(e) Stations authorized by these rules to transmit RTTY or data communications under automatic control may transmit third party communications. Any retransmitted messages on behalf of any third party must originate at a station that is under local or remote control.

EOF

Northern California Packet Band Plan

50 MHz

51.12	SOCAL backbone
51.14	Experimental
51.16	Keyboard to Keyboard
51.18	Experimental

144 MHz

144.91	Keyboard to Keyboard
144.93	LAN[1]
144.95	DX Cluster
144.97	LAN
144.99	LAN
145.01	Keyboard to Keyboard
145.03	Keyboard to Keyboard
145.05	Keyboard to Keyboard
145.07	LAN
145.09	LAN
145.71	9600 bps
145.73	LAN
145.75	TCP/IP
145.77	DX Cluster
145.79	LAN
146.58	DX Cluster

[1]Some TCP/IP in Sacramento grandfathered

220 MHz

223.54	Node uplink (East Bay)[1]
223.56	Node uplink (East Bay)
223.58	Node uplink ("Other")[2]
223.60	Node uplink (Sacramento Valley)
223.62	Node uplink (South Bay)
223.64	TCP/IP
223.66	Keyboard to Keyboard
223.68	LAN
223.70	Node uplink (Monterey Bay)
223.72	Node uplink (North Bay)
223.74	DX Backbone

[1]To move to .56 when SOCAL coordinates

[2]TCP/IP interlink (Sacramento) Not to interfere with node uplink.

440 MHz

441.50	All

Packet channels below 440MHz are available, but must be coordinated on a case-by-case basis as auxiliary allocations in conjunction with NARCC. Contact W6RGG for details.

900 MHz

903.500	1 Mhz wide - TCP/IP
904.500	1 Mhz wide - TCP/IP
915.500	1 Mhz wide - Experimental
916.100	200 Khz Wide - Experimental
916.300	200 Khz Wide - Experimental
916.500	200 Khz Wide - Experimental
916.650	100 Khz Wide - Experimental
916.750	100 Khz Wide - Experimental
916.810	20 Khz Wide - Experimental
916.830	20 Khz Wide - Experimental
916.850	20 Khz Wide - Experimental
916.870	20 Khz Wide - Experimental
916.890	20 Khz Wide - Experimental
916.910	20 Khz Wide - Experimental
916.930	20 Khz Wide - Experimental
916.950	20 Khz Wide - Experimental
916.970	20 Khz Wide - Experimental
916.990	20 Khz Wide - BBS links (Contra Costa County only)

900 MHz activity is on a non-interference basis to vehicle locator service. 900 MHz is not considered suitable for omindirectional systems, use for point-to-point links only.

1296 MHz

1248.500	1 Mhz wide - Full duplex with 1299.500 Experimental
1249.000 to 1249.450	Unchannelized - Experimental
1249.500	100 Khz wide - Experimental
1249.600	100 Khz wide - Experimental
1249.700	100 Khz wide - Full duplex with 1299.700 Experimental
1249.800	100 Khz wide - Full duplex with 1299.800 Experimental
1249.870	20 Khz wide - Experimental
1249.890	20 Khz wide - Experimental
1249.910	20 Khz wide - Full duplex with 1299.910 Experimental
1249.930	20 Khz wide - Full duplex with 1299.930 Experimental
1249.950	20 Khz wide - Full duplex with 1299.950 Experimental
1249.970	20 Khz wide - Full duplex with 1299.970 Experimental
1249.990	20 Khz wide - Full duplex with 1299.990 Experimental
1250.500	1 Mhz wide - Experimental
1251.500	1 Mhz wide - Experimental
1297.000 to 1298.000	Unchannelized - Experimental
1298.500	1 Mhz wide - Full duplex with 1299.500
1299.000 to 1299.450	Unchannelized - Experimental
1299.500	100 Khz wide - Experimental
1299.600	100 Khz wide - Experimental
1299.700	100 Khz wide - Full duplex with 1249.700 Experimental
1299.800	100 Khz wide - Full duplex with 1249.800 Experimental
1299.870	20 Khz wide - Experimental
1299.890	20 Khz wide - DX Packet Cluster users
1299.910	20 Khz wide - Full duplex with 1249.910 Experimental
1299.930	20 Khz wide - Full duplex with 1249.930 Experimental
1299.950	20 Khz wide - Full duplex with 1249.950 Experimental
1299.970	20 Khz wide - Full duplex with 1249.970 Experimental
1299.990	20 Khz wide - Full duplex with 1249.990 Experimental

Northern California Packet Band Plan

Continued from previous page

Definitions

Experimental — Anything goes except full service BBS or any 24 Hr/Day services (nodes, gateways, etc). This is where you can come and test new gear, programs, etc. These channels may be reassigned in the near future so no permanent activities please.

Backbone, Uplink, Interlink — No uncoordinated stations. These channels are for specific purposes as defined by the NCPA and affiliated groups. This is where the various BBS, nodes, and clusters interlink and are very high usage channels. Please use the normal 2 meter entry points of the network you want to access rather than these channels.

Keyboard to Keyboard — Anything but full service BBS, TCP/IP, or DX Cluster. Primarily chat channels. These are also the primary emergency channels. Some existing BBS systems (eg. WA6RDH) were grandfathered.

A gray area is "Personal BBS." A PBBS is one with a small number of users (rule-of-thumb: five or less). A PBBS should not be attracting general users thru beacons, etc. Bulletins should be confined to local information and not duplicate the general bulletins send to the community. That's the job of a full service BBS and we have lots of them in Northern California to use.

LAN — Local Area Network. Anything except TCP/IP and DX Cluster is tolerated. Please avoid placing high level digipeaters or nodes on these channels since they are "local." A low-level node that links into a backbone on another frequency is the preferred implementation.

TCP/IP — Stations using TCP/IP protocol on top of AX.25. Some AX.25 tolerated to communicate to TCP/IP stations if p-persistance access method used.

DX Cluster — Northern California DX spotting network. No other activity should be on these channels.

9600 Bps — Stations using 9600 Bps with direct FSK (G3RUH, TAPR, etc.) modems.

Procedure for changes

Users should contact either the frequency coordinator or the NCPA board. The frequency coordinator will then present the requests to the board at the next meeting along with suggested assignments. The NCPA board elected by you, the packet user, makes all assignments!

Electronic mail is preferred.

Note: NCPA does not coordinate individual stations, nodes, etc. The only station coordination is done by K6RAU for bulletin board systems.

Where to Find a BBS

N0ARY-1	Sunnyvale	144.93
KE6BX	Hollister	144.93
KJ6FY-1	Benicia	144.93
KI6YK	Danville	144.93
WD6CMU	Richmond	144.97
N6EEG	Berkeley	144.97
WA6EWV-1	S. Lake Tahoe	144.97
KD6JZZ-2	Sonora	144.97
K6LY	Monterey	144.97
KK6SZ-2	Sonora	144.97
N6LDL	Los Gatos	144.97, 145.71[1]
KI6WE	Pleasant Hill	144.97
KD6XZ-1	Sacramento	144.97, 441.50
AA4RE-1	Gilroy	144.99
W6SF	Stockton	144.99
KA6FUB	Martinez	144.99, 441.50
KE6LW-1	Yuba City	145.99, 441.50
N6OA	Lemoore	144.99
W6PW-3	San Francisco	144.99
WA6RDH	Dixon	145.01, 441.50
KG6EE	Santa Cruz	145.07
KI6EH	Santa Cruz	145.07
KA6EYH	Pacifica	145.07
N6IIU-1	Palo Alto	145.07, 223.56
KM6PX	Carmichael	145.07, 441.50
N6ECP	Redding	145.09
KB6IRS	Soquel	145.09
N6IYA-2	Felton	145.09
K3MC	Fremont	145.75[2]
WA6NWE-1	North Highlands	145.09, 441.50, 144.93[2]
K6RAU	Merced	145.09
WA6YHJ-1	Livermore	145.09
WX3K	Rohnert Park	145.73[3]
W8GEC	Boulder Creek	145.73
WA6HAM	Pittsburg	145.73
KB5IC	San Jose	145.73
KA6JLT-2	Menlo Park	145.73, 145.71[1]
WB6LYE	Eureka	145.73
KC6PJW	Cotati	145.73
AA6QR	Orinda	145.73
N6ZGY	Clovis	145.73
W6CUS-1	Richmond	145.79
WA6KTK-2	Manteca	145.79
N6MPW	Ben Lomond	144.79
N6QMY-1	Fremont	145.79, 441.50
K7WWA	Willits	145.79

[1]9600 baud port

[2]TCP/IP port

[3]Temporarily QRT, use KC6PJW

NCPA Board Meeting Minutes

Bob Arasmith, N0ARY
NCPA Secretary

The NCPA Board of Directors meeting took place in Pleasant Hill on March 7, 1993. The meeting started at 10:20. Those attending:

WD6CMU, KA6FUB, WB9LOZ, W6RGG, WX3K, N6HM, WB6YRU, WA6AEO, WA6GOL, KB6UUI, KK6SE, KA6UH, KC6PJW, K7WWA, W6BNJ, N6SLE, K6TAM, KD6IZY, WA6ZTY, KK6AM, KE6LW, N0ARY

1. Meeting was called to order by Eric (WD6CMU).

2. Incorporation George (K7WWA) indicated that being an "Association" gives about 90% of the protection of incorporation and is easier to get. This info is based on another club that George was associated with.

It was also mentioned that the ARRL also is a supplier for liability insurance but that you must be affiliated to take advantage of it. Bob (N0ARY) will see what is necessary to become affiliated and if we have the enough ARRL members to qualify.

3. Downlink We are still in need of Downlink articles. If anyone knows of a story of interest please notify the Downlink editor, K3MC.

4. Intro to Packet & TCP/IP books Eric (WD6CMU) is working with Ken (KD6IZY) on acquiring a printer. It was decided to print 500 copies of the Intro book and 250 of the TCP/IP book.

5. Resource Database Brad (WA6AEO) has received very few additional inputs. The bbss are represented well, about 80-90%. Nodes, TCP/IP and DXSPN are just getting started.

6. Bandplan Larry (WB9LOZ) will be sending the current bandplan to all the bbss along with his Intro to Packet series.

John (WX3K) announced the notice of filing to open up 219-200Mhz to amateur use. This is being targeted for packet linking.

7. 430 Coordination Bob (W6RGG) cannot locate the "green sheets" for the 430 backbone. These need to be re-submitted by the appropriate people.

8. OES Backbone, 9600 baud Brad (WA6AEO) will call Stan Harder regarding the proposed backbone to be funded by the state OES. With the current changes in state funding it is unsure if this is still available.

9. General Meeting The NCPA general membership meeting will be held on Saturday May 8th at 12:00 in the Sunnyvale area. The actual meeting facility will be arranged by Howard (N6HM).

There was a discussion to determine the best place and time to hold the meeting. The result was to have the meeting where the NCPA has the majority of it's members, south bay. The date and time were chosen to coincide with the Foothill flea market. The goal being that members from outside the area may be planning on attending the flea market and would hang around for the general meeting.

10. Board Meeting The next board meeting will be June 6th at 10:00. The location to be determined at a later time. The board meetings are typically held in locations central to the NCPA.

11. Treasurer Steve (WA6HAM) volunteered to take over the duties of treasurer. The subsequent motion carried. Good luck to Steve in his new position.

12. Secretaries Report The club stands at 156 members with 131 recently expired. All expired members will receive the next Downlink with a note indicating that this is the last issue they will receive.

The meeting was adjourned at 11:50.

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NCPA General Meeting May 8th

The NCPA will be holding its annual meeting for the general membership on Saturday May 8th at the Sunnyvale Department of Public Safety at 12:00 noon. This is the same day as the electronics flea market at Foothill College, so you have double the incentive to make the trip. All members and interested hams are invited to attend. This is your opportunity to elect the members of the NCPA board that will chart its course for the next year.

The Department of Public Safety is at 700 All America Way. From the flea market, take Hwy 280 east to Saratoga Sunnyvale Rd. and go north about 2mi. Turn left on El Camino Real, then right on Mathilda, All America is the next left, and the building is the one with the radio tower near the intersection with W. Olive. Enter the main reception lobby and take the stairs to the right and follow the signs, the meeting will be in the training room on the second floor. Parking is available in the Municipal Court parking lot at the corner of El Camino Real and S. Pastoria, or by the City Hall on S. Pastoria. Talk-in will be on 147.405MHz simplex.

To get to the flea market, take Hwy 280 to El Monte Rd. exit in Los Altos Hills, go south towards the hills and turn right into the college. The flea market starts about 7:00am and usually breaks up about 11. Talk-in 1s usually on 145.27(-). Don't forget your four quarters for parking!

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What is NCPA?

NCPA, the Northern California Packet Association, is an organization formed to foster the Digital Communications modes of Amateur Radio. So far, we have defined our goals as:

- Education
- Coordination

Education means making information available about various Digital modes, and this newsletter is but one part of that education process.

Coordination activities include frequency coordination (NCPA is recognized by NARCC as the official packet radio frequency coordinator) as well as coordinating people and their various uses of packet radio, be they DX Cluster, BBS, TCP/IP, keyboard-to-keyboard, NET/ROM, Traffic/NTS, Emergency uses of packet, or even experimenting with new frontiers of various digital modes.

We in NCPA believe that the next revolution in Ham Radio will come about in Digital Communications Technology, and in the beneficial coordination among all users of ham Digital Communications Technologies.

We invite you to join NCPA! Become part of the most dynamic group of packet folks in Northern California!

NCPA *Downlink*

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First Class Mail